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| 09/585,682      | 06/01/2000  | Kei-Yu Ko            | 3526.2US(97-1136.2) | 7481             |

7590 11/07/2003

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| EXAMINER |
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| ART UNIT | PAPER NUMBER |
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2815

DATE MAILED: 11/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/585,682

Applicant(s)

KO ET AL.

Examiner

Chris C. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 - 13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 14.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment filed on September 3, 2003 has been received and entered in the case.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 ~ 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Cargo et al.

Regarding claim 1, Cargo et al. discloses in Fig. 2 and column 2, lines 41 ~ 45 a semiconductor device, comprising:

- a semiconductor substrate (51) including an active surface;

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- at least one conductive line (55) disposed upon said active surface, said at least one conductive line being flanked by sidewall spacers;
- an undoped silicon dioxide cap (the lower portion of the bi-layer 61) disposed over and in contact with said at least one conductive line;
- a passivation layer (the upper portion of the bi-layer 61) over said undoped silicon dioxide cap; and
- at least one contact aperture (the area of 67) defined through said passivation layer and including at least one sidewall extending substantially perpendicularly relative to said semiconductor substrate, at least a portion of said at least one sidewall terminating at said undoped silicon dioxide cap.

As to the language on line 2 of claim 2, “a word line”, applicant should note that this is merely function language which does not differentiate the claimed apparatus from Cargo et al.

Regarding claim 3, Cargo et al. discloses in column 2, lines 41 ~ 45 said passivation layer (the upper portion of the bi-layer 61) comprising doped silicon dioxide.

Regarding claim 4, Cargo et al. discloses in column 2, lines 41 ~ 45 said passivation layer comprising borophosphosilicate glass, phosphosilicate glass, or borosilicate glass.

Regarding claim 5, Cargo et al. discloses said undoped silicon dioxide cap being at least partially exposed through said at least one contact aperture.

Regarding claim 6, Cargo et al. discloses in Fig. 2 and column 2, lines 41 ~ 45 a semiconductor device, comprising:

- a semiconductor substrate (51);
- at least one undoped silicon oxide structure (the lower portion of the bi-layer 61); and

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- at least one doped silicon oxide structure (the upper portion of the bi-layer 61) over said at least one undoped silicon oxide structure and having at least one sidewall substantially perpendicular to a plane of said semiconductor substrate, at least a portion of said at least one sidewall terminating at said at least one undoped silicon oxide structure.

Regarding claim 7, Cargo et al. discloses in Fig. 2 said at least one sidewall comprising a sidewall of an aperture (the area of 67).

Regarding claim 8, Cargo et al. discloses in Fig. 2 and column 2, lines 41 ~ 45 said at least one sidewall at least partially defines an aperture (the area of 67) through said doped silicon oxide structure.

Regarding claim 9, Cargo et al. discloses in column 2, lines 41 ~ 45 said at least one doped silicon oxide structure comprising borophosphosilicate glass, phosphosilicate glass, or borosilicate glass.

Regarding claim 10, Cargo et al. discloses in Fig. 2 and column 2, lines 41 ~ 45 said at least one undoped silicon oxide structure being at least partially located over a conductive structure.

Regarding claim 11, Cargo et al. discloses in Fig. 2 and column 2, lines 41 ~ 45 said at least one undoped silicon oxide structure comprising an insulative cap over a conductive line.

Regarding claim 12, Cargo et al. discloses in Fig. 2 and column 2, lines 41 ~ 45 said insulative cap being partially exposed through an aperture of said at least one doped silicon oxide structure defined by said at least one sidewall.

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Regarding claim 13, Cargo et al. discloses in Fig. 2 and column 2, lines 41 ~ 45 said at least one undoped silicon oxide structure being at least partially exposed adjacent said at least one sidewall.

### ***Response to Arguments***

4. Applicant's arguments filed on September 3, 2003 have been fully considered but they are not persuasive.

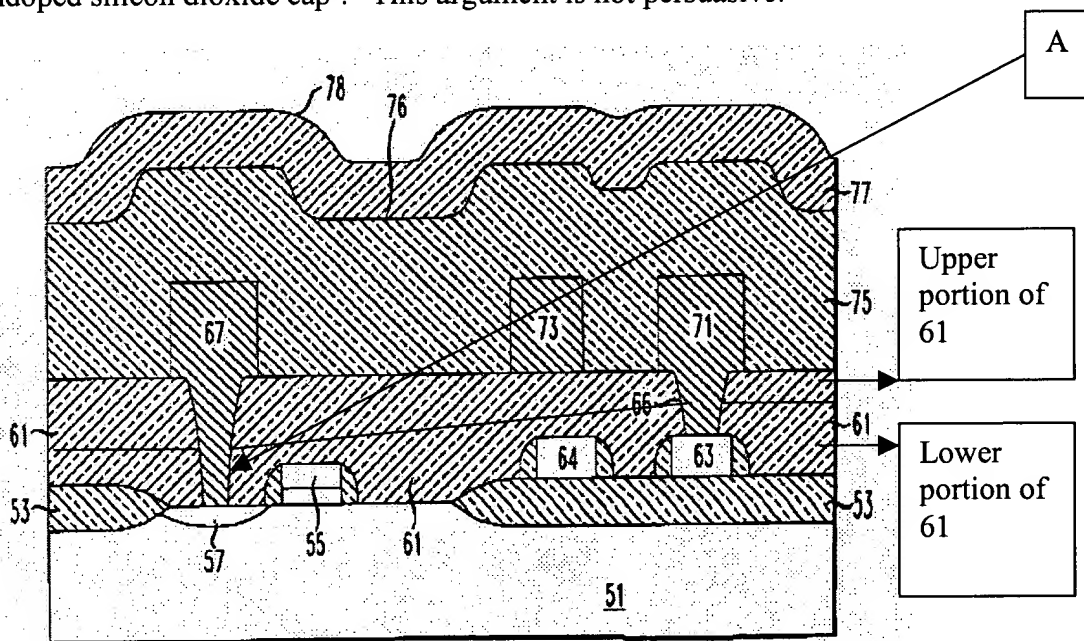
On page 6, applicant argues "it is respectfully submitted that the windows 66 and 67 of the semiconductor device described in Cargo and shown in Figs. 2, 4 – 6, and 8 thereof do not include sidewalls which extend 'substantially perpendicular' relative to the substrate 51 thereof. To the contrary, FIGs. 2, 4 – 6, and 8 of Cargo depict the windows 66 and 67 as having curved sidewalls which are oriented at a variety of nonperpendicular angles relative to the substrate 51." This argument is not persuasive. Since the term "substantially perpendicular" is broad language, any angle that is almost perpendicular to the semiconductor substrate read as "substantially perpendicular". Therefore, the term "substantially perpendicular" clearly does not structurally distinguish over Cargo et al.

Further, applicant argues "Cargo lacks any specific description of the type of etch process (isotropic or anisotropic) that may be used to form the windows 66 and 67." This argument is not persuasive because the invention, as set forth in the claims, is clearly directed to an apparatus. Nowhere do the limitations of the claims define the process in which the instant invention is to

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be manufactured. Thus, such argument clearly fails to distinguish the claimed invention from the disclosure of Cargo et al.

Furthermore, applicant argues "it is respectfully submitted that the description of Cargo (see FIGs. 2, 4-6, and 8) is limited to a semiconductor device which includes windows 66 and 67 with sidewalls that extend continuously and in uninterrupted fashion through dielectric 61, including both the upper doped silicon dioxide portion thereof and the lower, undoped silicon dioxide portion thereof. Thus, Cargo does not expressly or inherently describe that any portion of any of the sidewalls of window 66 or 67 terminates at an undoped silicon dioxide section of dielectric 61. As such, Cargo neither expressly nor inherently describes 'at least one contact aperture' with 'at least one sidewall' that includes 'at least a portion' which 'terminat[es] at [an] undoped silicon dioxide cap'." This argument is not persuasive.



Since the point (A in the above figure) clearly shows the sidewall (at the right side of the element 67) of the contact aperture terminates at the side surface of the undoped silicon dioxide cap (Lower portion of 61), hence Cargo et al. meets the limitation, at least one contact aperture with at least one sidewall that includes at least a portion which terminates at an undoped silicon dioxide cap, as required in claims 1 and 6.

For the above reasons, the rejection is maintained.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).



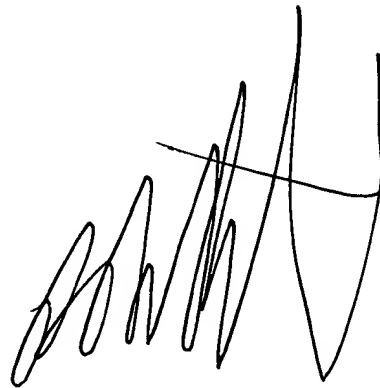
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu  
Examiner  
Art Unit 2815

c.c.  
11/4/03 9:53:48 PM

A handwritten signature in black ink, appearing to read 'BRADLEY BAUMEISTER', written over a horizontal line.

**BRADLEY BAUMEISTER  
PRIMARY EXAMINER**